Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C.

In the Matter of	)	
	)	
Redevelopment of Spectrum to	)	
Encourage Innovation in the	)	**ET Docket No. 92-9**
Use of New Telecommunications	)	
Technologies	)	

REPLY COMMENTS OF THE SATELLITE BROADCASTING AND COMMUNICATIONS ASSOCIATION

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July 8, 1992

EXECUTIVE SUMMARY

The Satellite Broadcasting and Communications Association (SBCA) is the national trade association representing all segments of the Home Satellite Dish (HSD) industry. SBCA commends the Commission for its foresight in attempting to provide frequency allocations to develop "emerging technologies" such as personal communications systems (PCS) including those employing satellites in low earth orbit (LEO), digital audio broadcasting (DAB), and generic Mobile-Satellite Services (MSS). Our recognition is based on the fact that HSD is itself an "emerging technology." SBCA is perplexed however that the FCC would consider reaccommodating displaced Fixed Service operations to bands allocated for current and future use by the HSD and DBS industries in view of the significant technical and public policy issues that such a reallocation would entail.

Over 3.7 million American households have invested in satellite systems, with some one million new installations occurring every three years. The HSD industry is emerging as a viable competitor to cable---a development which has been supported by both the Commission and by Congress. With some 200 video services and more than 75 audio services available via their satellite systems, dish owners today enjoy the most extensive array of programming available from any multichannel video delivery technology. HSD's also provide the only source of multichannel video to those consumers who live in rural areas outside the coverage area of off-air television.

As the Commission pursues further evaluation of ET Docket 92-9, SBCA urges serious consideration of the following conclusions:

1) Existing 4 GHz Fixed Service operations already impose significant costs and operational constraints upon the owners of HSD's. The addition of fixed microwave systems displaced from the 2 GHz band would impose a further major financial burden on HSD owners.

2) Interference from additional Fixed Service operations would compromise the ability of satellite operators to deliver ATV signals to the home in the future.

3) HSD would be the only multichannel video provider to be affected negatively by the reallocations proposed in the NPRM.

4) The decisions of WARC-92 have superseded the present Rule Making by making definitive frequency allocations for emerging technologies and setting forth the mechanisms for drafting the implementation procedures.

5) The Commission erred in its identification of possible reaccomodation bands by including the 11.7 - 12.2 GHz band and by not considering other bands which meet the Commission's criteria.

6) Any future consideration of reaccomodation bands should exclude the HSD and DBS downlink bands unless the Commission is willing to impose restrictions upon the fixed microwave systems to

protect HSD and DBS installations from interference. Future consideration of reaccomodation bands should include government and shared government/non-government bands as well as purely non-government bands both below and above 3 GHz.

As a result of these and other concerns, SBCA recommends that the Commission postpone further action on the NPRM pending a comprehensive and systematic review of the decisions of WARC-92 regarding frequency allocations for emerging technologies.

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REPLY COMMENTS OF THE SATELLITE BROADCASTING AND COMMUNICATIONS ASSOCIATION

I. INTRODUCTION

The Satellite Broadcasting and Communications Association, (SBCA) is pleased to submit its views to the Commission regarding the issues raised by the Notice of Proposed Rule Making in ET Docket No. 92-9 (the NPRM) and some of the comments it evoked.

SBCA is the national trade association of the satellite broadcasting industry and represents all of the major segments which are involved in supplying satellite home viewers with direct-to-the-home video and audio programming. These segments include the companies which manufacture, own, operate and/or lease the satellite transponders; the programmers who offer subscription services to home viewers; the satellite carriers which uplink and retransmit superstation and over-the-air network (in so-called "white areas" only) signals to the home; the manufacturers of receiving equipment and hardware; and the distributors and

retailers who deal directly with consumers in the sale of home satellite dish (HSD) equipment and programming.

SBCA is extremely concerned over the fact that the list of frequency bands identified in the NPRM as available for reaccommodation of existing 2 Ghz fixed microwave operations (NPRM at Footnote 16) included four bands which are vital to the present operation or future growth of satellite broadcasting. These are the C-band downlink and uplink frequencies at 3.7-4.2 Ghz and 5.925-6.425 Ghz respectively, the Ku-band downlink frequencies at 11.7-12.2 Ghz, and the band 17.7-19.7 Ghz which includes part of the WARC-92 allocation for BSS/HDTV and nearly two thirds of the broadcasting-satellite feeder link band newly enlarged by WARC-92.

Frankly, SBCA is incredulous that these satellite broadcasting bands are on the list for reallocation, and that the Commission would even consider them as possibilities. As explained below, the addition of more fixed microwave links at C-band would seriously aggravate the existing problem of terrestrial interference (TI) for the 3.7 million home satellite dishes (HSD) in this band. Furthermore, the addition of such links at Ku-band would introduce a major TI problem where none now exists for the rapidly growing Ku-HSD market. And finally, the addition of fixed microwave links in the 17.7-19.7 Ghz band would be in direct conflict with the new technology allocations of WARC-92 for BSS/HDTV at 17.3-17.8 Ghz and

the existing and new feeder link allocations in the 17.3-18.4 Ghz band.

Quite apart from SBCA's concern over which bands might be used to reaccommodate existing services displaced from the proposed new technologies bands is the fact that the decisions of WARC-92 have largely superseded the premises and conclusions of the FCC Staff Study on which the NPRM is based (FCC Report OET/TS 92-1). As detailed below, WARC-92 has allocated new (or identified existing) bands for each of the new technologies that the Commission cites to justify the need for such bands (NPRM at para 4).

Only in the case of personal communication services (PCS) do the bands identified by WARC-92 partly coincide with the bands proposed for all new technologies by the Commission. And even here, implementation of the WARC bands will raise issues that go far beyond those contemplated in the NPRM. Furthermore, the bands allocated by WARC-92 for other emerging technologies will displace a wider range of existing services than those considered by the NPRM. In view of this, SBCA recommends that the proposals in the present NPRM be set aside until the Commission has had the time to review the entire set of issues raised by the emerging technology allocation and regulatory actions taken by WARC-92.

Although SBCA feels that the WARC-92 decisions have rendered the present NPRM both premature and insufficient in scope, we do

recognize that some fixed microwave users around 2 GHz will eventually have to be reaccommodated. Therefore, we feel that the discussion of possible bands stimulated by the NPRM is valuable. However, in examining the Commission's criteria for selecting bands for reaccommodation of fixed microwave systems, we find that the Ku downlink band, 11.7-12.2 GHz, was included by mistake while other possibilities which do meet the criteria have apparently been overlooked.

II. OVERVIEW OF THE HSD INDUSTRY

The home satellite industry was born in the back yard of Stanford University Professor H. Taylor Howard in 1976. His extensive background in the national space program made it possible for him to design and install the first operational private home satellite antenna and receiver. As an amateur radio operator, Professor Howard shared his accomplishment with other "hams" around the world. As a result of these activities, HSD slowly developed as a "cottage industry." By 1980, limited quantities of satellite reception systems were available to the public, and some 5,000 systems were installed nation-wide at a cost of over $10,000 each. The price of complete systems dropped rapidly in the early '80's which fueled a boom in satellite system sales. In 1985 alone, the industry shipped 735,000 systems at an average cost of $3000 - $3500.

A new era of satellite television dawned on January 15, 1986. On that day, Home Box Office, Inc., began encrypting its satellite signal. It was then sold to those home satellite dish owners who had purchased a decoder. Several other program services quickly followed HBO's example and began encrypting or "scrambling" their satellite signals. These events ushered in an exciting new era for companies wishing to deliver programming direct-to-the-home. Regretfully, this era was also marked by public confusion, and consumer confidence in satellite television was temporarily shaken. 1986 shipments slipped to less than 230,000 systems. Many observers felt that the satellite industry would fade into obscurity much like the CB industry did after its major boom in the late '70s-early '80s.

But those who were ready to dismiss the satellite industry failed to recognize two factors: 1) the inherent technological superiority of satellite technology when compared to any other multichannel video delivery method, and 2) the strong entrepreneurial spirit of the companies involved in the industry. In fact, the scrambling of signals actually enhanced the technological edge satellite TV enjoyed, as it made possible the delivery of CD-quality digital audio direct-to-the-home. Propelled by these factors, HSD completely transformed itself from a hardware-driven to a software-driven industry. This metamorphosis was led by the thousands of retail satellite dealers across the country whose dedication to the satellite industry during difficult

times was rewarded by increased sales within 24 - 36 months. By the late '80s, the industry had surged, and was poised for the 1990's---"The Decade of the Dish."

The Home Satellite Industry Has Emerged as a Competitor to Cable TV

Today, 3.7 million Americans have invested in a home satellite system. That number continues to increase by approximately one million units every three years. Over 42% of the HSD installations are within cable franchised areas. Despite an average system cost of $2,500 including installation, consumers in growing numbers are choosing satellite TV as opposed to cable. The reliability of satellite reception hardware continues to improve, rivaling traditional consumer electronic products.

Home satellite television has become the best consumer electronics investment on the market today. Dish owners enjoy access to some 200 channels of video programming. Only via satellite can a consumer experience video which equals laser disc in its sharpness and live digital surround-sound audio. In addition, HSD consumers receive over 75 audio services direct via satellite throughout North America. With nearly 35 satellites to choose from, a satellite dish owner literally owns a "window on the world."

HSD Offers The Only Source of Multichannel Video to over 2 Million Households

Of the approximately 95 million TV households in the United States, nearly 2 million are located in so-called "white areas," those outside of the grade B coverage of an off-air network TV station. For these households, a satellite dish is their only multichannel video connection to the rest of the world.

This was recognized by the Congress when it passed the Satellite Home Viewers Act of 1988. The legislation established a special "Satellite License" in Section 119 of the Copyright Act, which grants satellite carriers the authority to retransmit network broadcast signals to "white area" households (as well as superstations to any HSD subscriber in the U.S.). Thousands of American citizens now have access to signals via HSD as a result of the license. However, Section 119 is scheduled to sunset on December 31, 1994. SBCA is currently seeking a means to continue the availability of those broadcast signals to HSD owners after the sunset date and has asked Congress to extend the license.

The facts are clear---without a satellite dish, "white area" households would not have television reception. They live in remote areas where cable service simply is not available today, nor is it likely ever to be due to the high cost of physical plant. Many of these households are in such sparsely populated regions

that neither is MMDS service a viable option. Thus, HSD is their only choice if they desire multichannel video.

Congress and the FCC Have Consistently Supported the Development of "Alternative Technologies" Such as HSD

The Commission deserves credit for its efforts to support the development of alternative technologies such as HSD. In 1986 the FCC enacted a limited pre-emption of local zoning regulations. This was designed to help the industry overcome the maze of restrictions placed on satellite installations by local governmental entities. As the Commission is well aware, this limited pre-emption has not fully resolved the problem of public zoning restrictions. The Commission recently acted again on the issue, striking down the satellite dish zoning ordinance of the Town of Deerfield, NY. The Town has now appealed the FCC's decision to the U.S. Court of Appeals.

The Commission is also considering a Petition for Rule Making submitted last year by the SBCA which asks the FCC to clarify and strengthen its policy on zoning. It is SBCA's sincere desire that the Commission move quickly to restate the basic right of consumers to own a satellite antenna.

Congress has also played an important role in encouraging HSD development. As discussed above, the 1988 Satellite Home Viewers Act, recognized the important role of HSD in providing television service. The HSD industry is also featured prominently in on-going legislative efforts to increase competition with cable.

III. THE GROWTH OF THE HSD INDUSTRY IS ALREADY HAMPERED BY FIXED SERVICE OPERATIONS

The difficulties of sharing in the 4 GHz band were recognized in several comments filed earlier in this proceeding by incumbent 2 GHz operators and equipment manufacturers, including: The Large Public Power Council; Alcatel; TeleSciences, Inc.; Harris Corporation; and NRECA. SBCA echoes these comments.

As the Commission is aware, the satellite industry shares C-band uplink and downlink allocations with Fixed Service operators today. This sharing has placed significant restrictions on the HSD industry, especially in the 3.7 - 4.2 GHz allocation (C-Band downlink). C-Band reception in areas near 4 GHz Fixed Service transmission towers and transmission paths is possible only by utilizing expensive avoidance/suppression techniques. These often work to limit the availability or affordability of HSD systems.

For example, many homes are built on small lots with limited rear yards. Often a roof-mounted antenna is the only option (if not precluded by local zoning regulations) for obtaining the required sight-lines to the satellite orbital arc. But consumers with roof antennas face the problem of greater terrestrial interference (TI) from the 4 GHz Fixed Service. Thus, they are in a catch-22....if they install the antenna at ground level and use the surrounding buildings and terrain to assist in shielding the antenna from TI, they lose access to several satellites; if they install the system on the roof, they face heavy interference which must then be suppressed at the home owner's expense.

With today's frequency modulated satellite TV transmissions, and with current microwave relay channeling plans, a certain degree of TI suppression can be achieved through the use of "band-pass" and "notch" filters. The problem of TI is so widespread that these filters are built-in to many of the high-end receivers available on the market today. The consumer pays a sizable premium for this feature however, and it is generally not available on the moderately priced units. Consumers who have units without internal TI filters are forced to purchase an external filter in order to reduce TI. These filters are installed either inside the house at the receiver or outside at the feed assembly. A typical "band-pass" filter can cost a consumer approximately $200.

If the problem is moderate to severe, "notch" filters are utilized. They are custom tuned to attenuate the offending wide-band microwave signal (offset from the desired C-Band signal by 10 MHz). These filters carry wholesale prices ranging from $350 for a "single notch" to $780 for a unit capable of notching out six offending carriers. Special microwave absorption pads mounted on the surface of the antenna to improve sidelobe performance are also required in some cases. These pads, which cost about $100, help attenuate the interfering signal. Finally, many consumers faced with TI may be forced to purchase so-called "deep" dishes which help shield the feed assembly from the microwave interferences. These "deep" dishes cost approximately $400 more than a "regular" satellite antenna. Thus, the total price tag for TI suppression can easily run from $700 to $1,000 over and above the system cost.

IV. SATELLITE DELIVERY OF DIGITAL VIDEO WOULD BE MORE SEVERELY THREATENED BY THE COMMISSION'S PROPOSAL

While the impact of TI is very serious on the existing analog FM video being delivered today, a minimal level of interference protection is provided by the fact that the analog satellite signal is centered within the transponder bandwidth, and displaced in frequency from the terrestrial carriers. This characteristic makes it possible to attenuate terrestrial interference through the use of filters.

In the near future, however, digitally compressed and digitally modulated video signals will be delivered via satellite. These digital signals are spread throughout the entire transponder bandwidth. Any use of TI filters would result in the loss of a portion of the digital satellite signal, rendering it unusable. For this reason, TI may well pose an insurmountable threat to the satellite delivery of digital video for all homes lying in or near a fixed microwave transmission path.

For the same reason, the delivery of Advanced Television (ATV) signals via satellite will also be impacted by TI. The SBCA is active in the FCC ATV planning process through membership in PS/WP-4 and its Working Group on Satellite Testing of ATV. This Working Group has now identified TI as a potentially significant problem facing ATV proponents. The Working Group is currently seeking data from the various ATV proponents to determine how their systems will perform in a TI environment. This information will be shared with the Commission when available.

For these reasons, it is imperative that the Commission exclude current and future HSD and DBS downlink allocations from consideration as possible reaccomodation bands unless the Commission is willing to impose restrictions upon the fixed microwave systems to protect HSD and DBS installations from interference.

V. THE HSD INDUSTRY WOULD SUFFER UNDER THE COMMISSION'S PROPOSAL WHILE OTHER MULTICHANNEL VIDEO PROVIDERS ARE PROTECTED

As discussed earlier, despite all of the formidable obstacles to its development, the HSD industry has emerged as a viable competitor in the multichannel video delivery market place. The other multichannel video providers include cable, "wireless cable" (MMDS), and Satellite Master Antenna Systems (SMATV). SBCA is very concerned that among these technologies, only HSD will be negatively impacted by the Commission's proposal to relocate the Fixed Service operations from the 2 GHz band.

In this scenario, MMDS is the big winner. The NPRM allows those operations to remain in the 2 GHz band, and they don't have to share with other operators---the best of all worlds.

Cable operators will have very little to worry about---their C-Band satellite receiving antennas are generally larger, "licensed" downlink facilities. Thus, new Fixed Service operations will be required to coordinate their operations with these licensed facilities to insure that interference is kept to a minimum. Couple this coordination requirement with the fact that most cable headends utilize 12-16 foot antennas which afford much higher TI rejection, and it is clear that the impact on cable operators will be minimal.

SMATV operators will also be largely unaffected by this proposed Rule Making. They, like traditional cable operators, utilize larger downlink systems. Their systems are often licensed; they, too, are afforded the benefit of coordination.

Even if all of the licensed downlink facilities (some 9,200 as of 1989) in the U.S. were forced to install TI suppression equipment, the total investment, while not insignificant, pales in comparison to the cost of suppressing TI for the 3.7 million HSD installations across the country.

VI. THE ACTIONS OF WARC-92 HAVE SUPERSEDED THE PRESENT RULE MAKING

In support of the need for "emerging technologies" bands, the Commission cited several examples of requests for new services for which sufficient spectrum is allegedly unavailable (NPRM at para 4). These examples include 200 MHz for new personal communications services (PCS); 40 MHz for data PCS; 33 MHz for a generic mobile-satellite service (MSS); 70 MHz for a digital audio broadcasting service; and 33 MHz for low-Earth orbit (LEO) satellites. To meet such requirements, the Commission proposes to reallocate for new technologies 220 MHz of the spectrum currently used for fixed microwave services in the band 1850-2200 MHz. The specific candidates for reallocation are the subbands 1850-1990, 2110-2150, and 2160-2200 MHz.

In the month that followed adoption of the NPRM, however, WARC-92 answered the spectrum needs of these new technologies in a different and much more comprehensive manner. Instead of three sub-bands around 2 GHz to accommodate all of the emerging technology requirements, WARC-92 provided the following international allocations available to the United States:

- 230 MHz for PCS and data PCS (the Future Public Land Mobile Telecommunication System, FPLMTS) at 1885-2025 and 2110-2200 MHz

- 75 MHz in each direction for MSS at 2160-2200 and 2500-2535 MHz for downlinks, and 1970-2010 and 2655-2690 MHz for uplinks (an additional 33 MHz of downlink spectrum at 1492-1525 MHz and 35 MHz of uplink spectrum at 1675-1710 MHz were also allocated for MSS in Region 2 but the U.S. excluded itself from these allocations)

- 50 MHz for digital audio broadcasting at 2310-2360 MHz (this allocation applies only in the U.S. and India; an additional 40 MHz was allocated at 1452-1492 MHz for all countries except the U.S., and another 20 MHz at 2535-2655 MHz for 12 countries in Region 3 and the northeastern part of Region 1

- A total of about 5 MHz in each direction for "little" LEOs at frequencies near 138, 149, 315, 390, and 400 MHz (including both primary and secondary allocations)

- 16.5 MHz in each direction for "big" LEOs at 1610-1626.2 MHz for uplinks (and some downlinks) and 2483.5-2500 MHz for downlinks

In addition, WARC-92 allocated 500 MHz of spectrum in Region 2 for a new technology not considered in the NPRM: wide RF band HDTV broadcasting. Specifically, WARC-92 allocated the band 17.3-17.8 GHz to the broadcasting-satellite service (BSS) for HDTV, extended the upper limit of the existing BSS feeder link band at 17 GHz to 18.4 GHz, and provided a new feeder link band at 24.75-25.25 GHz.

Nearly all of the foregoing emerging technology allocation actions of WARC-92 were accompanied by footnotes and Resolutions specifying when and how the bands could be implemented.

The inescapable conclusion is that the WARC-92 decisions go much further in providing spectrum for emerging technologies than do the proposals in the NPRM. More spectrum is provided, many additional frequency bands are involved, and services other than fixed microwave will be subject to sharing and/or reaccommodation in other bands. Moreover, the international procedures for implementing the WARC-92 new technology bands and for protecting

existing services in these bands are much more complex than those contemplated in the NPRM.

For all of these reasons, SBCA concludes that the premises and conclusions of the NPRM have been rendered obsolete and should be set aside until the Commission has dealt in a comprehensive and systematic manner with all of the new technology bands allocated at WARC-92.

VII. THE BAND 11.7-12.2 GHz DOES NOT MEET THE COMMISSION'S OWN CRITERIA FOR A REACCOMMODATION BAND, WHILE BANDS THAT DO MEET THESE CRITERIA ARE NOT CITED IN THE NPRM

To reaccommodate the existing fixed microwave users that might be displaced by the reallocation of parts of the 1850-2200 MHz band for new services and technologies, the Commission listed seven frequency bands (NPRM at footnote 16). The Commission indicated that the selection of these seven bands was guided by the following criteria:

- The national allocation of the band must be for non-government use only (NPRM at footnote 11 and para 21).

- All fixed microwave bands above 3 GHz, both the common carrier and private bands, would be made available (NPRM

at para 20)--i.e., the national allocation must include common carrier and/or private radio services.

To begin with, SBCA considers that both of these criteria are unnecessarily restrictive. There should be nothing sacrosanct about frequency bands currently allocated for government use, or to joint government/non-government use. Moreover, bills now before Congress would require the federal government to make available up to 200 MHz of spectrum for non-government use (NPRM at footnote 11). Under these circumstances, it is entirely premature for the Commission to restrict its attention to non-government spectrum either for new technologies or for the reaccommodation of existing services.

The restriction for reaccommodation to bands above 3 GHz is also quite arbitrary. There are non-government, or shared government/non-government fixed microwave bands below 3 GHz but outside the 1850-2200 MHz frequency range that could have been considered.

But even if we accept the Commission's criteria, an examination of the national table of frequency allocations (as published in "Tables of Frequency Allocations and other Extracts from: Manual of Regulations and Procedures for Federal Radio Frequency Management," NTIA, September 1991) suggests that the Commission did not apply

its criteria consistently in identifying the seven bands it cited as candidates for reaccommodation.

Probably the most egregious example is the inclusion of the 11.7-12.2 GHz Ku band. Although the international table includes primary allocations to the Fixed Service (FS) and the Fixed-Satellite Service (FSS), Footnote 837 to the table stipulates that the FS allocation is on a secondary basis throughout the U.S., Canada, and Mexico. More importantly, the national table of allocations suppresses even a secondary allocation to the FS. Indeed, the absence of the FS from this band is the main reason that it has become so heavily used by a variety of FSS applications, including VSATs, TV program distribution, video teleconferencing, and HSD services.

In other sections of these Reply Comments, SBCA has indicated the great harm that would be caused to the HSD industry if an HSD band were used to reaccommodate services displaced from the 1850-2200 MHz band. The fact is that the Ku-band does not meet the Commission's criteria for a reaccommodation band and should not have been suggested for consideration in the first place.

In contrast to the mistaken inclusion of the 11.7-12.2 GHz band, at least three bands which do meet the Commission's criteria were inexplicably excluded from the NPRM. These are the bands 6425-6525 MHz, 6875-7125 MHz, and 10.55-10.6 GHz. All three bands are

exclusively for non-government use, and with the possible exception of the 6425-6525 MHz band,[1] the national allocation table in each case includes a primary allocation to the FS. Neither the NPRM nor the FCC Staff Study explains why these three bands were not cited as candidates for reaccommodation, despite the fact that the first two bands were included as entries in Table 2 of the Staff Study.

Based on the foregoing observations, SBCA would recommend that in any future consideration of bands for reaccommodation, the Commission exclude the 11.7-12.2 GHz band altogether, but explicitly include:

- The three bands just described

- Government and joint government/non-government bands allocated nationally to the FS both below and above 3 GHz.

VIII. CONCLUSIONS

SBCA commends the Commission for its foresight in attempting to provide frequency allocations to develop "emerging technologies" such as personal communications systems (PCS) including those

[1]In the case of the 6425-6525 MHz band, Table 2 of the supporting Staff Study indicates that it is shared by B/C Auxiliary, Cable TV, common carrier, and private radio, although the NTIA Tables show national allocations only to the FSS and the Mobile Service.

employing satellites in low earth orbit (LEO), digital audio broadcasting (DAB), and generic Mobile-Satellite Services (MSS). Our recognition is based on the fact that HSD is itself an "emerging technology." SBCA is perplexed however that the FCC would consider reaccommodating displaced Fixed Service operations to bands allocated for current and future use by the HSD and DBS industries in view of the significant technical and public policy issues that such a reallocation would entail.

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